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EXAMINER	
YANG, RYAN R	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/893,396	Applicant(s) D'SOUZA ET AL.	
	Examiner Ryan R Yang	Art Unit 2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 March 2004* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/15/2004 has been entered.

2. This action is responsive to communications: Amendment, filed on 1/15/2004. This action is non-final.

3. Claims 1-25 are pending in this application. Claims 1, 8, 15 and 20 are independent claims. In the Amendment, filed on 1/15/2004, claims 1, 8 and 15 were amended, claims 4, 12 and 18 were canceled, and claims 20-25 were added.

4. The present title of the invention is "Hardware-based accelerated color correction filtering system" as filed originally.

Claim Rejections - 35 USC § 102

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 15 and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Ijntema et al. (6,285,350).

As per claim 15, Ijntema et al., hereinafter Ijntema, discloses a hardware-implemented method of color video data correction filtering, comprising the steps of:

gamma decompensating input color video data referenced to a non-linear color space ("To fully compensate the color errors, the RGB signals have to be linearized by compensating for the gamma correction applied in the camera", column 2, line 31-33);

compensating for color point data of a plurality of constituent colors of a color monitor by applying a plurality of pre-calculated gamut shifting arrays to the color point data, each of the plurality of pre-calculated gamut shifting arrays corresponding to a multiplication look-up table (MLUT) comprising pre-calculated values that represent specific multiplication operations ("a transformation of the RGB signals with a 3x3 matrix can be done", column 2, line 34, since a matrix operation includes both multiplication and addition operations, it represents a specific multiplication operation); and

compensating the color point data after application of the plurality of pre-calculated gamut shifting arrays for non-linearities of the color monitor by applying a plurality of non-linearization tables to the color point data to produce output color video data compensated for non-linearities and color points of the color monitor ("Finally, the gamma correction has to be applied again", column 2, line 36; "The characteristics could be stored in a LUT", column 2, line 59).

7. As per claim 19, Ijntema demonstrated all the elements as applied to the rejection of independent claim 15, supra, and further discloses each of the steps of gamma decompensating, compensating using the plurality of pre-calculated gamut shifting arrays and compensating using the plurality of non-linearization tables is

performed at a substantially full video rate (since the LUT table is used instead of multiplication operations, the gamut shifting arrays is performed at the full processing speed of the graphics controller).

8. Claims 20-25 is rejected under 35 U.S.C. 102(b) as being anticipated by Oku et al. (5,489,996).

As per claim 20, Oku et al, hereinafter Oku, discloses a color correction system, comprising:

a color filter that receives image data and produces color video data (Figure 5 37 the First Color Correction Unit is considered a color filter because it "normalizes input image signals and converts them to the data signals in a region suitable for the color adjustment for the input image signals, and makes the color adjustment", column 6, line 59-62);

a color point correction system that receives the color video data and produces color point corrected video data (Figure 5 44 the 2nd Color Correction Unit); and

a non-linearity correction system that receives the color point corrected video data an produces non-linearity corrected video data (Figure 5 48 3rd Color Correction Unit which compensates for the non-uniformity of recording materials).

9. As per claim 21, Oku demonstrated all the elements as applied to the rejection of independent claim 20, supra, and further discloses the color filter decompensates for non-linear RGB input based on a standard color image gamma function (column 7 – column 8, equation 9).

10. As per claim 22, Oku demonstrated all the elements as applied to the rejection of independent claim 20, supra, and further discloses a plurality of multiplication look-up tables (MLUTs) ("The input data normalizing unit 56 receives the image data from the host computer, and converts them into R, G, and B data each consisting of eight bits, through gradation converting tables LUT1-1 61, LUT1-2 62, and LUT1-3 63", column 7, line 33-37).

11. As per claim 23, Oku demonstrated all the elements as applied to the rejection of independent claim 22, supra, and further discloses each of the plurality of MLUTs are loaded with pre-calculated values that represent specific multiplication operations ("The hardware of the first color correction unit may be constructed as shown in FIG. 9. As shown, the three look-up tables 61, 62 and 63 of the input normalizing unit and the linear matrix calculator 57 are constructed with a total of nine look-up tables 64 60 72 and three adders 3, 74 and 75", column 9, line 25-30, since a matrix operation in a linear matrix calculator includes both multiplication and addition operations, it represents a specific multiplication operation.

12. As per claim 24, Oku demonstrated all the elements as applied to the rejection of independent claim 20, supra, and further discloses each of the plurality of MLUTs comprises pre-calculated RGB component outputs for each of 256 intensities of each primary color ("the calculated R data is further converted in accordance with formula (10) below so that the converted data always maintains the 256 gradations", column 9, line 39-41).

13. As per claim 25, Oku demonstrated all the elements as applied to the rejection of independent claim 20, supra, and further discloses the non-linearity correction system comprises a set of non-linearization color look-up tables (CLUTs) ("The output characteristic correction LUT 75 is mainly used for compensating for manufacturing variations in the apparatus and in the recording medium used", column 14, line 32-34, since the variation due to manufacturing is inherently non-linear, the tables generated to compensate it is inherently non-linear).

Claim Rejections - 35 USC § 103

14. Claims 1-2, 5, 7-9, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ijntema et al. (6,285,350) and further in view of Oku et al. (5,489,996).

As per claim 1, Ijntema et al., hereinafter Ijntema, discloses a hardware-implemented color video data correction filtering system, comprising:

a plurality of linearization tables to gamma decompensate input color video data referenced to a non-linear color space ("To fully compensate the color errors, the RGB signals have to be linearized by compensating for the gamma correction applied in the camera", column 2, line 31-34; "The characteristics could be stored in a LUT", column 2, line 59);

a plurality of a set of pre-calculated gamut shifting arrays to compensate for color point data of a plurality of constituent colors of a color monitor with each set of pre-calculated gamut shifting arrays corresponding to a multiplication look-up table (MLUT) comprising pre-calculated values that represent specific multiplication operations, each

set of pre-calculated gamut shifting arrays coupled to one linearization table of the plurality of linearization tables ("a transformation of the RGB signals with a 3x3 matrix can be done", column 2, line 34, since a matrix operation includes both multiplication and addition operations, it represents a specific multiplication operation);

and a plurality of non-linearization tables coupled to the plurality of hardware adders to compensate for non-linearities of the color monitor and produce output color video data compensated for non-linearities and color points of the color monitor ("Finally, the gamma correction has to be applied again", column 2, line 36; "The characteristics could be stored in a LUT", column 2, line 59).

Ijntema discloses a color correction system. Ijntema further discloses a matrix for compensating color. It is noted that Ijntema does not explicitly disclose a plurality of shifting array and hardware adders coupled to one of the pre-calculated shifting arrays, however, this is known in the art as taught by Oku. Oku discloses a color correcting system in which the color adjusting matrix is built with a plurality of look-up tables and adders ("The hardware of the first color correction unit may be constructed as shown in FIG. 9. As shown, the three look-up tables 61, 62 and 63 of the input normalizing unit and the linear matrix calculator 57 are constructed with a total of nine look-up tables 64 60 72 and three adders 3, 74 and 75", column 9, line 25-30).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Oku into Ijntema because Ijntema discloses a system for color correction with matrix for color compensation and Oku

discloses the matrix used for color compensation can be constructed with a plurality of look-up table and adders in order to accelerate the processing speed.

15. As per claim 8, Ijntema discloses a computer system, comprising:

a processor (Figure 1 C);

video memory coupled to the processor (since LUT could be used in digital implementation (column 2, line 55-60), it is inherent that memory is used to store LUT); and

a color video data correction filtering system coupled to the processor, the system comprising:

a plurality of linearization tables to gamma decompensate input color video data referenced to a non-linear color space ("To fully compensate the color errors, the RGB signals have to be linearized by compensating for the gamma correction applied in the camera", column 2, line 31-34; "The characteristics could be stored in a LUT", column 2, line 59);

a plurality of a set of pre-calculated gamut shifting arrays to compensate for color point data of a plurality of constituent colors of a color monitor with each of the plurality of pre-calculated gamut shifting arrays corresponding to a multiplication look-up table (MLUT) comprising pre-calculated values that represent specific multiplication operations, each set of pre-calculated gamut shifting arrays coupled to one linearization table of the plurality of linearization tables ("a transformation of the RGB signals with a 3x3 matrix can be done", column 2, line 34, since a matrix operation includes both multiplication and addition operations, it represents a specific multiplication operation);

a plurality of non-linearization tables coupled to the plurality of hardware adders to compensate for non-linearities of the color monitor and produce output color video data compensated for non-linearities and color point of the color monitor ("Finally, the gamma correction has to be applied again", column 2, line 36; "The characteristics could be stored in a LUT", column 2, line 59).

Ijntema discloses a color correction system. Ijntema further discloses a matrix for compensating color. It is noted that Ijntema does not explicitly disclose a plurality of shifting array and hardware adders coupled to one of the pre-calculated shifting arrays, however, this is known in the art as taught by Oku et al., hereinafter Oku. Oku discloses a color correcting system in which the color adjusting matrix is built with a plurality of look-up tables and adders ("The hardware of the first color correction unit may be constructed as shown in FIG. 9. As shown, the three look-up tables 61, 62 and 63 of the input normalizing unit and the linear matrix calculator 57 are constructed with a total of nine look-up tables 64 60 72 and three adders 3, 74 and 75", column 9, line 25-30).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Oku into Ijntema because Ijntema discloses a system for color correction with matrix for color compensation and Oku discloses the matrix used for color compensation can be constructed with a plurality of look-up table and adders in order to accelerate the processing speed.

16. As per claims 2 and 9, Ijntema and Oku demonstrated all the elements as applied to the rejection of independent claims 1 and 8, supra, respectively, and Ijentema further discloses the plurality of linearization tables comprises three linearization tables

(since Ijntema discloses in Figure 1 amplifiers for each of red, green and blue colors, A_R, A_G and A_B, and "The characteristics could be stored in a LUT", column 2, line 59), the set of pre-calculated gamut shifting arrays comprises three pre-calculated gamut shifting arrays ("a transformation of the RGB signals with a 3x3 matrix can be done", column 2, line 34), the plurality of non-linearization tables comprises three non-linearization tables, and the plurality of constituent colors comprises three constituent colors (since Ijntema discloses the amplifiers is used for each of red, green and blue colors, it is inherent that they are the three constituent colors and since the linearization table is generated for each of the three colors, it is inherent that non-linearization table is generated for each of the thee colors).

Oku further discloses "the plurality of a set of pre-calculated gamut shifting arrays comprises nine pre-calculated gamut shifting arrays" (Figure 7A and Figure 9; 'the three look-up tables 61, 62 and 63 of the input normalizing unit and the linear matrix calculator 57 are constructed with a total of nine look-up tables 64 60 72", column 9, line 25-30).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Oku into Ijntema because Ijntema discloses a system for color correction with matrix for color compensation and Oku discloses the matrix used for color compensation can be constructed with a plurality of look-up table and adders in order to accelerate the processing speed.

17. Claims 3 and 11 rejected under 35 U.S.C. 103(a) as being unpatentable over Ijntema et al. (6,285,350) and Oku et al. (5,489,996) as applied to claim 1 above, and further in view of Wilt et al. (US 2002/0085015).

18. As per claims 3 and 11, Ijntema and Oku demonstrated all the elements as applied to the rejection of independent claims 1 and 8, supra, respectively.

Ijntema and Oku disclose a system of color correction for a CRT. It is noted that Ijntema and Oku do not explicitly disclose the CRT (which is a non-linear display device) has sRGB color space, however, this is known in the art as taught by Wilt et al., hereinafter Wilt. Wilt discloses a color convertion method using non-linear sRGB color space ([0005]).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Wilt into Ijntema and Oku because Ijntema and Oku disclose a system of correcting color relating to a CRT (which has non-linear color space) and Wilt discloses a color correcting system using non-linear sRGB space in order to extend the correction method to displays, scanners and digital cameras ([0005]).

18. As per claims 5 and 14, Ijntema and Oku demonstrated all the elements as applied to the rejection of independent claims 1 and 8, supra, respectively.

Ijntema discloses a system of correcting color with a graphics controller (Figure 1 C). The controller can use look-up table for processing ("The characteristics could be stored in a LUT", column 2, line 59). It is noted that Ijentema does not explicitly disclose a graphics controller coupled to the plurality of pre-calculated gamut shifting arrays,

however, this is known in the art as taught by Oku. Oku discloses a color correcting system in which the color adjusting matrix is built with a plurality of look-up tables ("The hardware of the first color correction unit may be constructed as shown in FIG. 9. As shown, the three look-up tables 61, 62 and 63 of the input normalizing unit and the linear matrix calculator 57 are constructed with a total of nine look-up tables 64 60 72", column 9, line 25-30), wherein compensation for color point data through utilization of the plurality of pre-calculated gamut shifting arrays is performed at the full processing speed of the graphics controller (since the LUT table is used instead of multiplication operations, the gamut shifting arrays is performed at the full processing speed of the graphics controller).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Oku into Ijntema because Ijntema discloses a system for color correction with matrix for color compensation and Oku discloses the matrix used for color compensation can be constructed with a plurality of look-up table and adders in order to accelerate the processing speed.

19. As per claims 7 and 13, Ijntema and Oku demonstrated all the elements as applied to the rejection of independent claims 1 and 8, supra, respectively, and Ijntema further discloses the non-linearities of the color monitor comprise an input-output characteristic for each constituent color of the color monitor ("The characteristics could be stored in a LUT", column 2, line 59, where the characteristics is the characteristics of the monitor).

20. Claims 6 and 10 rejected under 35 U.S.C. 103(a) as being unpatentable over Ijntema et al. (6,285,350) and Oku et al. (5,489,996) as applied to claim 1 above, and further in view of Shelton (US 2002/0161803).

As per claims 6 and 10, Ijntema and Oku demonstrated all the elements as applied to the rejection of independent claims 1 and 8, supra, respectively.

Ijntema discloses a system of color correction which could be applied to TV sets and computer monitors (column 3, line 18-19). It is noted that Ijntema does not explicitly disclose the input color video data is input from a website, however, this is known in the art as taught by Shelton. Shelton discloses a color correction method in which color data can be transmitted from a website (Figure 2 18).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Shelton into Ijntema and Oku because Ijntema and Oku disclose a system of color correction a pluralities of monitor and Shelton discloses the color data could be transmitted from a website in order to correct a plurality of remotely located monitor.

21. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ijntema et al. (6,285,350) as applied to claim 15 above, and further in view of Shelton (US 2002/0161803).

As per claim 16, Ijntema demonstrated all the elements as applied to the rejection of independent claim 1, supra.

Ijntema discloses a method of color correction which could be applied to TV sets and computer monitors (column 3, line 18-19). It is noted that Ijntema does not explicitly

disclose the input color video data is input from a website, however, this is known in the art as taught by Shelton. Shelton discloses a color correction method in which color data can be transmitted from a website (Figure 2 18).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Shelton into Ijntema because Ijntema discloses a method of color correction a pluralities of monitor and Shelton discloses the color data could be transmitted from a website in order to correct a plurality of remotely located monitor.

22. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ijntema et al. (6,285,350) as applied to claim 15 above, and further in view of Wilt et al. (US 2002/0085015).

As per claim 17, Ijntema demonstrated all the elements as applied to the rejection of independent claim 15, supra.

Ijntema discloses a method of color correction for a CRT. It is noted that Ijntema does not explicitly disclose the CRT (which is a non-linear display device) has sRGB color space, however, this is known in the art as taught by Wilt et al., hereinafter Wilt. Wilt discloses a color convertion method using non-linear sRGB color space ([0005]).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Wilt into Ijntema because Ijntema disclose a method of correcting color relating to a CRT (which has non-linear color space) and Wilt discloses a color correcting method using non-linear sRGB space in

order to extend the correction method to displays, scanners and digital cameras ([0005]).

Response to Arguments

23. Applicant's arguments filed 3/20/2004 have been fully considered but they are not persuasive.

As per claim 15 and 19, applicant alleges Ijntema does not disclose the use of a plurality of pre-calculated gamut shifting arrays corresponding to a multiplication look-up table (MLUT) comprising pre-calculated values that represent specific multiplication operations. In reply, examiner considers a 3x3 matrix is the gamut shifting array used to compensate for color point data and the LUT storing the characteristics (column 2, line 59) the non-linearization table, and since a matrix operation includes both multiplication and addition operations, it represents a specific multiplication operation.

As per claims 1-14 and 16-18, applicant alleges since Ljntema does not satisfy limitations as discussed above, therefore, 35 USC 103 rejection is defective. In reply, examiner considers Ijntema satisfies claimed limitations.

Conclusion

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Ryan Yang** whose telephone number is **(703) 308-6133**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Michael Razavi**, can be reached at **(703) 305-4713**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 305-47000377.

Ryan Yang
May 31, 2004